

1 What is Claimed Is:

2 1. A communications system comprising:
3 a base station having an adaptive antenna with a plurality of main array
4 antenna elements for generating a plurality of communication beams; and
5 a gateway station coupled to said base station, said gateway station
6 forming a plurality of beams commands by communicating a plurality of control
7 signals to the base station to form the communication beams.

2. A communications system as recited in claim 1 wherein said adaptive antenna comprises a plurality of panels comprise the plurality of main array elements.

3. A communications system as recited in claim 1 wherein said base station comprises a plurality of auxiliary elements for canceling interference between the communication beams.

4. A communications system as recited in claim 1 wherein said auxiliary elements are weighted to provide interference canceling.

5. A communications system as recited in claim 1 wherein said gateway station is rf coupled to said base station.

6. A communications system as recited in claim 1 wherein said base station is wireless.

7. A communications system as recited in claim 1 wherein said gateway station is positioned on a stratospheric platform

8. A communications system as recited in claim 1 wherein said reconfigurable antenna comprises a phased array antenna.

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1 9. A communications system as recited in claim 1 wherein said
2 main array is a modular.

1 10. A communications system as recited in claim 1 wherein said
2 main array comprises a plurality of modules coupled to a bus.

1 11. A communications system as recited in claim 1 wherein said
2 bus is coupled to a controller.

1 12. A communications system as recited in claim 1 further
2 comprising a plurality of users receiving said communications beam.

1 13. A communications system as recited in claim 1 further
2 comprising a limiter coupled within a feedback path.

1 14. A communications system as recited in claim 1 further
2 comprising a nulling processor.

1 15. A communications system as recited in claim 14 wherein said
2 nulling processor comprises an element code despread and a user code despread.

1 16. A communications system as recited in claim 15 wherein said
2 nulling processor comprises a weighted feedback loop similarly coupled to an output
3 signal.

1 17. A communications system as recited in claim 15 wherein said
2 nulling processor comprises auxiliary elements coupled to an output signal.

1 18. A communications system as recited in claim 1 wherein said
2 base station comprises a plurality of summing blocks coupled to said main array
3 element for generating a summed signal, said gateway station comprising an analog-
4 to-digital converter coupled to a noise injection circuit and said summed signal, said
5 summed signal coupled to a demultiplexer and a digital beam forming circuit.

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1 19. A communication system as recited in claim 1 wherein said
2 base station comprises a user code despreading circuit coupled to an element code
3 despreading circuit which is coupled to said main array elements.

1 20. A communications system comprising:
2 a plurality of wireless base stations having adaptive antennas with a
3 plurality of main array antenna elements for generating a plurality of communication
4 beams;

5 a gateway station coupled to said plurality of wireless base stations
6 through a plurality of multiple dynamic links, said gateway station forming a plurality
7 of beams with a plurality of data packets by communicating plurality of a control
8 signals to the base station to form the communication beams using at least one link
9 from a first base station and a second link through a second of the base station.

1 21. A method of operating a communication system having a
2 gateway station and a plurality base station comprising:

3 dividing a communication signal into a plurality of multiple dynamic
4 links at the gateway station;

5 directing the multiple dynamic links to a plurality of base stations; and
6 coupling the multiple dynamic links through the plurality of base
7 stations.

1 22. A method as recited in claim 21 further comprising canceling
2 interference between said multiple dynamic links.

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